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ABSTRACT

Los Angeles Pierce College has been using Computer-Based Spelling Instruction (CBSI) software in spelling enrichment classes since 1992. Students who have used the program average 96% on final exams, and student retention proves excellent. The CBSI module performs the following functions: (1) administers a 1,200 word pretest; (2) divides missed pretest words into 15 word "chapters"; (3) provides a printout of words missed on the pretest; (4) provides an optional printout for facilitators to identify patterns of errors or to demonstrate rules of phonics or spelling; (5) divides each chapter into three lessons (i.e., spelling, practice quiz, and random review of previously learned words); (6) provides exposure to the words to be learned in three learning modalities (i.e., visual, auditory, and tactile); (7) presents practice involving extensive repetition; (8) keeps a cumulative record of time spent on lessons; (9) administers chapter tests, including words from prior chapters; (10) requires a minimum score of 70% on each chapter test to advance students to the next chapter; (11) prints test results; and (12) administers a final exam covering all the words misspelled on the pretest. The CBSI program is IBM compatible, requires a DECtalk speech synthesizer and personal computer with a hard drive. The program also requires a facilitator to explain the operation of the program and to monitor student progress. The cost of the program is $150. (KP)

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Los Angeles Pierce College

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COMPUTER-BASED SPELLING INSTRUCTION

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Computer-Based Spelling Instruction (CBSI) is PC software (IBM or IBM compatible) that provides spelling instruction to all disabled and non-disabled adults including the blind, but not the deaf. The instruction provided by the CBSI program is also individualized--students focus only on material that they need to learn. The CBSI program can be used as the basis for a self-contained class or as a supplement to regular classroom instruction.

The CBSI program requires a DECTalk speech synthesizer, and a PC computer with a hard drive. CBSI can be run on older PC computers (8086 processor) or on newer computers (e.g. 486 processor). If a school has more than one PC attached to its own DECTalk, then that school can install the CBSI program on all those computers.

The CBSI program does not require a teacher or a classroom because the CBSI program is totally self-contained. The CBSI does require, however, a "facilitator" (for example, a teacher or counselor). The facilitator will: 1) decide in which module a student will begin, 2) explain the operation of the program has a student begins his/her first module, 3) monitor student progress and pace by means of weekly student printouts run from the CBSI program, 4) help students with study techniques and strategies, 5) drop a student from the computer, 6) move a student to a new module after that student completes a module, and 7) if appropriate, give a student a grade for work completed in CBSI.

Students using the CBSI program can disabled or non-disabled, and can be any age as long as they understand the meanings of the words of the module in which they are working. These students do <u>not</u> need to know how to use a computer, but they do need to know the keyboard.

The data contained in the CBSI program is divided into five modules (groups of words) that present a total of 1,200 carefully chosen words. The words in these modules are grouped by grade levels: fourth (module one), sixth (modules two and three), and tenth (module four); module five consists of homonyms. The first four modules each contain 225 words, and the fifth module contains 300 words. When a student is ready to begin the CBSI program, the facilitator determines the grade level of the student, and this, in turn, dictates the module into which the student will be placed. There is no formal mechanism for making this determination, however, the facilitator can use any desired measure including the student's reading level or a writing sample.

The first time a student begins a module, the facilitator must type in a secret password. The use of this password insures that the student is assigned to the correct computer, and that he/she begins in the appropriate module. This process also records the module number under the student's name, and this locks the student into that module. Each time the student comes in to work, the CBSI program automatically transfers the student into the correct module. Until a student has completed a module, the CBSI program does not allow entry into another module by accident or otherwise. As a student proceeds through a module, the CBSI program also records the student's current chapter number, and at each startup reminds the student of that number.

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The CBSI program is divided into four components: 1) pretest, 2) learning and practice, 3) chapter tests, and 4) final exam.

1) PRETEST After a student is initially logged onto the computer with the password, the CBSI program administers a pretest to the student. In this pretest, the program (through the DECTalk) reads each word in the module one at a time; after each word is pronounced, students try to type the word. All the words misspelled by the student in this pretest are saved in the computer under the student's name; the words spelled correctly are ignored. Only the words

misspelled by a student will be presented to that student for mastery. In this manner, instruction is totally individualized, and does not waste a student's time working on words that he/she already knows.

After the student finishes the pretest, the program automatically divides all the misspelled words into "chapters" of 15 words each. The program also generates a printout by chapters of all these words.

2) LEARNING AND PRACTICE After a student completes a module pretest, he/she begins the task of learning how to spell the set of words misspelled on the pretest. The way the CBSI program is set up, the students will receive all three learning modalities as they learn their words: visual (the computer monitor), auditory (the DECTalk), and tactile (the keyboard).

The learning and practice section of the CBSI program is divided into three lessons: 1) learning and repetition, 2) practice quiz, and 3) review of previous chapters. In lesson one, the student learns to spell the words by seeing the words broken up into syllables and by repetition of the spelling. Students are not able to complete lesson one until they can spell all fifteen words correctly. Lesson two (a practice quiz given on the computer) allows the students to see how they will do on the chapter test without the score being recorded. At the end of the practice quiz, the program shows the score and lists the words that were misspelled. Students can take the practice quiz as often as necessary before they take the chapter test. Lesson three is a random review of words the student has already learned from prior chapters. This lesson helps to keep the words fresh in a student's mind. All three lessons can be repeated as often as necessary before a student attempts the chapter test. (NOTE: It is not expected that working on the computer alone will produce the desired mastery of the words to be learned. Students are also required to study the words at home using the printout).

3) CHAPTER TESTS Each chapter has a chapter test given on the computer. After students complete all three lessons in a chapter, they can take the chapter test. Each chapter test

(except for the first chapter) consists of the 15 words from that chapter, plus five preselected words from prior chapters. Students must score a minimum of 70% on each chapter test to get credit for that chapter, and to proceed to the next chapter. If a student scores below 70%, they can return to the practice section of the CBSI program, and retake the chapter test at a later time. The inclusion of prior words in chapter tests, and the 70% minimum score are the primary reasons that students do well on the final, and why they retain these words long after completing the program.

4) FINAL EXAM After a student has completed all the chapter tests, he/she is ready to take the final exam (also given on the computer). The final exam consists of ALL the words misspelled on the original pretest. As with the chapter tests, a student must score at least 70% or more on the final exam to complete the module. If a student scores below 70%, he/she can get a printout of the misspelled words, and then must go back and do more practice work before they retake the final exam. After a student takes and passes the final exam, the CBSI program prints out the results including the final score and all the misspelled words. After the final exam, students are ready to move on to the next module.

The amount of time required for students to finish a module is based on several factors: 1) the number of chapters (or words) they need to learn, 2) how quickly they are able to do the work, 3) how much time they spend each week doing the work, and 4) how much time is spent studying at home. For these reasons, there is no predetermined amount of time for a student to complete a module. The facilitator has the option to require that some or all students take the same amount of time to complete a module, or he/she may be more flexible and allow some or all students to take longer to finish a module. If placement into a module is done correctly, students complete the pretest needing to learn between 150 and 200 words (10-14 chapters). At a rate of one chapter per week, the average student will therefore require a semester to finish a module.

The CBSI program also includes components to help the facilitator. These components include: 1) program management and 2) an authoring program.

PROGRAM MANAGEMENT The CBSI program provides the facilitator with all the tools necessary to operate the program. These include: 1) the ability to print student reports, 2) reprint pretest results, 3) drop one or more students, 4) move students into a new module, and 5) put a student on "hold". This latter option temporarily prevents a student from logging onto the program, and requires a meeting with facilitator for any reason including student performance.

All student progress in the chapter tests and the final exam is recorded in the computer for retrieval at any time by the facilitator. This information can be used to monitor both student progress and rate of progress, and is available as a printout for student use. This information includes each chapter test score, the cumulative score, words that each student misses on the test, and the cumulative time the student has spent working on their module.

Another feature built into the CBSI program is an option to print out how any student spelled the words he/she missed on the pretest. This list will allow the facilitator to work with a student on patterns of errors, phonics, or general spelling rules. This list may also be given to the student so they can possibly discover some patterns of spelling errors.

AUTHORING COMPONENT With this component, the facilitator can create up to five new modules using his/her own data. Each of these modules will contain 225 words, thus allowing for a total of 1,000 new words to be added to the CBSI program. The authoring component is almost totally automatic. It will walk the user through the process of inputing and editing data, checking that the data is pronounced correctly on the DECTalk, and installing the program and data on the user's computer(s).

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The CBSI program has been used at Pierce College since 1992. In that year, the college approved the establishment of a new course, Special Education 49 (Spelling Enrichment), so that students may receive credit for their work on the CBSI program. This is a one-unit class that students may take up to four times.

Since Special Education 49 was established, class enrollment has averaged approximately 40-50 students per semester. The students who have worked on the CBSI program represent a wide range of abilities and knowledge. The final exam scores of these students has averaged 96% for a module.

Student retention of the words they learned on the CBSI program has also proved excellent. Since the inception of Special Education 49, students have been tested for one and two semesters following completion of a module. Even after the second semester following completion of a module, students still knew 85-95% of the words.

The CBSI program was designed to go far beyond the teaching of spelling without the need for an instructor. CBSI is not merely an excellent tool for spelling instruction, but is more importantly a vehicle to improve memory techniques and enhance study habits. Because CBSI encourages facilitators to individualize their curriculum, each student is gifted with study methods tailor made to that student's preferred learning modality. In short, CBSI can teach students how to learn.

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To summarize, each CBSI module performs the following functions:

1) Pretests each student to determine which words need to be learned (this individualizes instruction)

2) Divides the words to be learned into "chapters" of 15 words each

3) Provides a printout of the words by chapter so students will have a home study reference

4) Provides an optional printout for the facilitator of the misspelled words from the pretest; this list can be used to identify patterns of errors or to demonstrate rules of phonics or spelling

5) Divides each chapter into three lessons (main spelling lesson, practice quiz lesson, and a random review lesson of previously-learned words)

6) Provides exposure to the words to be learned in three learning modalities: a) visual (on the monitor), b) auditory (with the DECtalk), c) tactile (on the keyboard)

7) Presents practice for each chapter that involves extensive repetition of the words

8) Keeps a cumulative record of the amount of time each student spends working on the lessons

9. Administers chapter tests that include words from prior chapters which compels students to continually review the words already learned

10. Requires a minimum score of 70% on each chapter test to advance students from one chapter to the next

11. Prints out the results of each student chapter test (this printout includes chapter test scores and words that were misspelled on each test)

12. Administers a final exam covering all the words misspelled on the pretest; as with the chapter tests, students must score at least 70% or higher on the final to complete the module; the program also prints out the results (final score and misspelled words)

The cost of the CBSI program (five modules, authoring module, and documentation) is:

$150